What is claimed is:

1. A microcannula based microsurgical device designed to operate within Schlemm's Canal of the eye and to treat a controlled amount of adjacent ocular tissue comprising:

a flexible tubular sheath having an outer diameter of no more than 500 microns, having proximal and distal ends, and configured to fit within Schlemm's Canal;

a distal assembly for sealed introduction and removal of materials and tools;

wherein suction is provided through the microcannula sheath during treatment of adjacent tissue.

2. A microcannula based microsurgical device as described in claim 1, wherein the tissues to be treated include at least one of the trabecular meshwork and juxtacanalicular tissues adjacent to the inner radius of Schlemm's Canal.

3. A microcannula based microsurgical device as in claim 1, wherein the microcannula has one or more openings directed toward an inner radius thereof.

4. A microcannula based microsurgical device as described in claim 1, wherein the suction level is at least 4 inches of Hg.

5. A microcannula based microsurgical device as described in claim 1, further comprising at least one inflatable or expandable member to provide stabilization of the microsurgical device and surrounding tissues.

6. A microcannula based microsurgical device as described in claim 1, further comprising at least one inflatable or expandable member to provide sealing of Schlemm's Canal during treatment.

7. A microcannula based microsurgical device as described in claim 1, wherein the microcannula has a length of at least 15 mm.

8. A microcannula based microsurgical device as described in claim 1, wherein the tubular sheath is curved in the range of 10–15 mm diameter.

9. A microcannula based microsurgical device as described in claim 1, further comprising a plurality of markers set at regular intervals along the tubular sheath such that each marker is spaced from adjacent markers by a fixed distance along the sheath to provide depth measurement.

10. A microcannula based microsurgical device as described in claim 1, wherein the tubular sheath additionally comprises materials to enhance observation of the device positioning under image guidance.

11. A microcannula based microsurgical device as described in claim 1, wherein the tubular sheath comprises a polyimide or a fluoropolymer.

12. A microcannula based microsurgical device as described in claim 1, wherein the microcannula additionally comprises an inner member with a proximal end and a distal tip;

and wherein the sheath and inner member are sized such that the inner member fits slidably within the sheath and the distal tip of the inner member acts to treat adjacent tissue through one or more openings in the distal end of the microcannula.

13. The microcannula based microsurgical device of claim 12, wherein the inner member acts to remove tissues from an inner wall of Schlemm's Canal.

14. A microcannula based microsurgical device designed to operate within Schlemm's Canal of the eye and to remove a controlled amount of adjacent ocular tissue comprising,

a flexible tubular sheath having an outer diameter of no more than 500 microns, having proximal and distal ends, and configured to fit within Schlemm's Canal;

a distal assembly for sealed introduction and removal of materials and tools;

an inner member with a proximal end and a distal tip sized such that the inner member fits slidably within the sheath,

wherein the sheath has one or more openings directed toward an inner radius at the distal end,

and the sheath and inner member act to remove adjacent tissue through the one or more openings in the distal end of the sheath.

15. A microcannula based microsurgical device as in claim 14, further comprising a lumen extending through the tubular sheath and wherein suction is provided through the lumen during removal of adjacent tissue.

16. A microcannula based microsurgical device as described in claim 14, wherein the distal tip of the inner member is shaped for tissue dissection, cutting, ablation or removal.

17. A microcannula based microsurgical device as described in claim 14, wherein suction is used to position the adjacent tissue to be removed into a lumen of the tubular sheath.

18. A microcannula based microsurgical device as described in claim 17, wherein the inner member performs removal of tissue within the lumen of the tubular sheath.

19. A microcannula based microsurgical device as described in claim 14, further comprising a plurality of markers set at regular intervals along the tubular sheath such that each marker is spaced from adjacent markers by a fixed distance along the sheath to provide depth measurement.

20. A microcannula based microsurgical device as described in claim 14, wherein, the tubular sheath additionally comprises materials to enhance observation of the device positioning under image guidance.

21. A microcannula based microsurgical device as described in claim 14, wherein the tubular sheath comprises a polyimide or a fluoropolymer.

22. A microcannula based microsurgical device as described in claim 14, wherein the microcannula has a length of at least 15 mm.

23. A microcannula based microsurgical device as described in claim 14, wherein the flexible tubular sheath is curved in the range of 10–15 mm diameter.

24. A microcannula based microsurgical device as described in claim 14, wherein the inner member is curved in the range of 10–15 mm diameter.

25. A microcannula based microsurgical device as described in claim 14, wherein the outer member is formed of a multi-lumen tube.

26. A microcannula based microsurgical device as described in claim 14, wherein the inner member comprises steel, nickel titanium alloy or tungsten.

27. A microcannula based microsurgical device as described in claim 14, wherein the inner member comprises an optical fiber.

28. A microcannula based microsurgical device as described in claim 27, wherein illumination from the optical fiber is directed from the distal end of the microcannula at an angle of 45 to 135 degrees from an axis of the microcannula to be coincident with an area of tissue removal.

29. A microcannula based microsurgical device as described in claim 14 wherein the tubular sheath comprises at least one inflatable or expandable member to provide stabilization of the device and surrounding tissues.

30. A method for treating Schlemm's Canal of an eye comprising inserting a flexible microcannula based microsurgical device with an outer diameter of no more than 500 microns into Schlemm's Canal and applying suction at a level of at least 4 inches of Hg.

31. A method for treating Schlemm's Canal of the eye as described in claim 30 wherein the microcannula comprises one or more openings directed toward an inner radius thereof to treat specific tissues adjacent to Schlemm's Canal.

32. A method for treating Schlemm's Canal of the eye as described in claim 30 wherein the microcannula additionally comprises an inner member that acts to remove tissue.

33. A method for treating Schlemm's Canal of an eye comprising the steps of:

(a) inserting a flexible microcannula with an outer diameter of no more than 350 microns into Schlemm's Canal;

(b) injecting a flowable material to expand at least a segment of Schlemm's Canal to facilitate microcannula access;

(c) removing the microcannula;

(d) inserting a microcannula based microsurgical device with an outer diameter of no more than 500 microns into Schlemm's Canal;

(e) and effecting a modification in the tissues adjacent to Schlemm's Canal to increase aqueous outflow.

34. The method of treating Schlemm's Canal of the eye of claim 33 wherein step (e) comprises removal of tissues from the inner wall of Schlemm's Canal.

35. The method of treating Schlemm's Canal of the eye of claim 33 wherein step (e) comprises placing of an implant at least partially residing in Schlemm's Canal.